

rather disquieting to read in a specimen sentence:—
 "Omnia entusiasmo posedas per su la tendenco, ne klarigar, sed trublar l'okulo di l'intelekto."

Einführung in die Lehre vom Bau und den Verrichtungen des Nervensystems. By Prof. Ludwig Edinger. Pp. iii+190. (Leipzig: F. C. W. Vogel, 1909.) Price 6 marks.

THIS is an excellent work consisting of fifteen lectures on the various parts of the central nervous system. Dr. Edinger has a very pleasant way of introducing information concerning the functions of the nervous structures as he describes them, a feature which makes his works much more readable than those which give merely geographical descriptions of the parts under consideration. Another feature of the present work is that it keeps the reader constantly informed respecting the comparative anatomy and evolutionary antiquity of the particular structure he is studying.

The book consists of 190 pages, but there are probably less than 100 pages of letterpress owing to the generous way in which it is illustrated. There are no fewer than 161 diagrams, in addition to a plate showing the development of the Neencephalon over the Palæencephalon. The diagrams are so clear and helpful to the student that a mere smattering of knowledge of the German language is probably all that is necessary for the book to be a useful addition to his library.

The first chapter, on methods of investigation of the nervous system, is largely historical; the second is devoted to the study of the histological elements; while the third is a charming combination and correlation of the histology, physiology, embryology and comparative anatomy of the nervous system as a whole. The author then presents a general survey of the brain and spinal cord, and subsequently discusses the various tracts of the spinal cord and traces them from their origin to their termination. Then follow chapters on the pons, cerebellum, mesencephalon, basal ganglia and connections of the optic nerve. The last four chapters are devoted to the various portions of the cerebrum, the corpus striatum, connections of the olfactory nerve, the internal capsule, &c.

On p. 61 there are two diagrams of the root distribution of cutaneous sensation (front and back views) which, so far as our memory serves us, are not in accordance with the findings of Head, Starr or Thorburn, and we are inclined to think that Edinger's diagrams are incorrect.

The addition of an index to the book would greatly enhance its value.

Annuaire astronomique de l'Observatoire royal de Belgique, 1909. Published under the direction of G. Lecointe. Pp. vii+347+258. (Brussels: Hayez.)

OF the numerous publications of the Brussels Observatory, none is, perhaps, more generally useful than this "Annuaire," and we know of no other annual which excels it in general usefulness. All the usual tables, ephemerides, &c., relating to the sun, moon, planets, comets, and stars are contained in the first part, which is followed by explanations as to how to use the tables, and a long list of the names and positions of the principal observatories of the world. A very useful and explicit statement of the legal time used in various countries is clearly illustrated by a folding map, particularly coloured to show the countries which have so far adopted "universal" time and those which have not; the date line is shown in detail too.

Other parts of the "Annuaire" deal with surveying problems—there are some useful formulæ and forms for amateur surveyors—the form of the earth and the more recent work in astronomy.

W. E. R.

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LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Mining Administration in India.

IN view of the recent attacks made in the London *Mining Journal* on Mining Administration in India, and also, both directly and indirectly, on the director of the Geological Survey, we have deemed it advisable to send you the following extracts, one of which is taken from the *Mining Journal* of June 26, p. 801, and the other from the published evidence given by Sir Thomas Holland before the Royal Commission upon Decentralisation, and published in Blue-book Cd. 4369 (vol. x. of Minutes of Evidence, p. 47):—

From the *Mining Journal* of June 26, p. 801, leading article, headed "Mining Administration in British India."

"We cannot close our observations on the evidence tendered to the Commission without noting the light thrown by the report on the sincerity of Sir Thomas Holland's attempt to suggest that we had imputed corruption to Government officials in India. As an argument against the establishment of a separate Provincial Survey, the director of the Geological Survey said:—

"If I transferred an officer, say, to Burma, or any province beyond my control, and he was the officer who governed the granting of mining concessions, I have not the slightest doubt that within a year, if he had only ordinary intelligence, he would discover that his salary would¹ be only a fraction of his income." We do not remember even to have seen the chief of what is professedly a scientific body so frankly confess his distrust of his colleagues' honesty and professional pride."

By changing one word in quoting the Blue-book, the *Mining Journal* has altered the whole meaning of the remarks made by the director. In view of the comments made, it is for the *Mining Journal* to prove that this misquotation is accidental. Having regard to the claim of the *Mining Journal* that it "circulates all over the world," the writer of the article must know that it will be read by many to whom the Blue-books are not accessible, for no assistance has been given by a reference to the particular volume in which the director's evidence is recorded. As the inaccurate quotation has already received a start of some weeks before reaching us in India, we shall be glad if, by publishing this letter, you will assist in preventing any further dissemination of a grossly unjust insinuation.

With this sample before them, we can safely leave your readers to estimate the value of the attacks on the Indian administration recently made in the *Mining Journal*.

Needless to add, the relation between us and Sir Thomas Holland is one of perfect and mutual confidence.

We have been unable to communicate with three of our

¹ The italics are ours.

Evidence of Sir Thomas Holland, director, Geological Survey of India, published in Blue-book Cd. 4369, being vol. x. of the Minutes of Evidence taken before the Royal Commission upon Decentralisation in India, p. 47:—

Question No. 43455: "Is not an officer who has to deal with mining concessions in any part of the world subject to great temptation?"

"Yes; if I transferred an officer, say to Burma, or to any province beyond my control, and he was the officer who governed the granting of mining concessions, I have not the slightest doubt that within a year, if he had ordinary intelligence, he would discover that his salary need¹ be only a fraction of his income."

colleagues, who are at present absent in the field, but we are convinced that if they had the opportunity they would join with us in appending their signatures to this letter.

T. H. D. La Touche, H. H. Hayden (Superintendents, Geological Survey of India).

P. N. Datta, E. Vredenburg, L. L. Fermor, G. E. Pilgrim, G. H. Tipper, H. Walker, K. A. K. Hallows, G. de P. Cotter, J. J. A. Page, H. C. Jones, A. M. Heron, M. Stuart, N. D. Daru (Assistant Superintendents, Geological Survey of India).

W. A. K. Christie (Chemist, Geological Survey of India).

Geological Survey of India, Calcutta.

An Optical Phenomenon.

IN reference to the query of "V. P." in NATURE of June 3 (p. 398), under the above title, I describe a simple experiment which will, in all probability, lead to an easy explanation.

Allow sunlight to fall upon a vessel filled with water to a depth of a few inches. If the bottom be white, so much the better. A bath-tub is excellent. Now draw a finger through the water so as to produce a wake, in which are to be seen the familiar "dimples" characteristic of vortex motion. Then, on the bottom will be observed, corresponding to each dimple, a black shadow with a brilliant edge, just the same sort of appearance, in fact, as that described by your correspondent. The same, by the way, may be observed in shallow brooks.

The explanation in this case is not difficult. A very small central portion forms a concave lens, the enfeebled illumination of which on the bottom is negligible. The portion surrounding this and extending as far as the plane water-surface acts somewhat after the manner of a convex lens, concentrating the light passing through it into a more or less sharply defined ring, a "focal ring," so to speak, as contrasted with a "focal point." The diameter of this ring would approximate that of the whole dimple. By far the greater part of the light falling upon the area of the dimple is collected here, and, consequently, the field within appears black aided by contrast. It is easy to see that an essential is the relative smallness of the concave part of the dimple, as is borne out by failure to obtain the phenomenon on a large scale by stirring water in a beaker.

Now, following up this experiment and considering window-panes, one would expect to find there flaws of a dimpled nature, or else of a corresponding heterogeneity of refractive index. The former I have found to be the case, especially surrounding air-bubbles, as is easily to be detected by the touch in many cases. The formation of these flaws could be accounted for by the contraction of the air during cooling in process of manufacture. Moreover, in this instance, the bubble itself, forming the concave lens, need not always be small, since it is usually of a focal length far shorter than that of the surrounding portions of the pane.

Flaws of this type are rarer than those of an opposite or protruding type, which, of course, produce patterns with a white centre.

L. G. HOXTON.

University of Virginia, July 26.

A Quest on of Percentages

IN reply to the letter on the "Calculation of Percentages" in NATURE of August 5, may I venture the opinion that the only common-sense method of finding the percentage of marks gained by a student in a series of examinations is to add together all the marks obtained by the student, and find what percentage this total is of the maximum possible?

By this method the more difficult papers, which have a greater number of marks allotted to them, retain an important proportion in the result, whereas the elementary papers, which are worth only a few marks, have only a small influence on the final percentage.

If one were to calculate the percentage for each paper, and then average these percentages, this would manifestly be the same as giving the same number (i.e. 100) of marks for each paper. This would necessitate equal difficulty in each paper set.

LEWIS WHALLEY.

39 Clarendon Street, Keighley, Yorks, August 13.

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IN NATURE of August 5 Mr. Cunningham appeals to mathematical readers for information on the question of averaging three results, viz. :—

either giving $37/50 + 50/50 + 71/100$,

$(37 + 50 + 71)/200 = 79/100$

or

$(2 \times 37 + 2 \times 50 + 71)/300 = 81\frac{3}{100}$.

Though I am not a mathematician, but a chemist, I trust I can give the required answer.

The way of averaging depends on the weight of the single results. By the latter way of calculating, the third result affects the average with twice the weight of the former way. Equal weights for each result require equal denominators. Taking for a very simple instance the problem of averaging between 20/100 and 40/100, which is obviously 30/100, the first way of averaging, as proposed by Mr. Cunningham, would permit a calculation like this (20/100 being = 2/10 = 1/5, &c.) :—

$2/10 + 40/100 = 42/110$ or $1/5 + 40/100 = 41/105$,

or (40/100 being = 400/1000 = 4000/10,000)

$1/5 + 400/1000 = 401/1005$ or $1/5 + 4000/10,000 = 4001/10,005$.

These results, I believe, will explain better than many words the essential point of this question.

Breslau, Parkstr. 13.

R. ABEGG.

Kohlrausch's "Physical Measurements."

REPLYING to the letter of Mr. Nelson in NATURE of August 12, the value given for the k in question in the ninth German edition of "Kohlrausch's Lehrbuch der praktischen Physik" (1901) is 0.457. But it must be borne in mind that this value is deduced on the assumption that the specific gravity of the brass weights is 8.4, and seeing that the specific gravity of various samples of "brass" varies not inconsiderably, it is immaterial whether one uses 0.457 or 0.458 for the correction factor. The rounded value, 0.46, is near enough for most purposes, and that is the one given in the tables of Landolt-Birnstein. For accurate work the specific gravity of the weights must be determined in any case, and the value of k calculated for these particular weights.

G. RUDORF.

"Ivor," Cranley Gardens, Muswell Hill,
London, N., August 12.

A Kinematical Illusion.

THE following experiment is easily tried, and throws, I think, some light on a certain type of illusions.

A small cogwheel from an old American clock is the only apparatus required. Holding the axle in the finger and thumb of the right hand, give it a twirling motion, say counter-clockwise. Let the teeth of the wheel click gently against a small card, or the finger-nail of the left hand. On looking at the wheel the spokes appear to revolve counter-clockwise (as they do) and the teeth to revolve in the reverse direction.

C. S. JACKSON.

25 Nightingale Place, Woolwich.

RÖNTGEN RAYS IN THE DIAGNOSIS OF DISEASE.

GREAT development has taken place in the last few years in the application of Röntgen rays to the diagnosis of disease. At first it was only possible to show the shadows cast by bones and by dense foreign bodies, usually metallic bodies. With improvement in apparatus and in method, the art of radiography has advanced in such a way that it is now possible to show, not only the outlines of the bones, but minute details of their structure, and, more than this, a considerable amount of detail can now be shown in the soft parts of the limbs. While at first surgeons alone found X-ray diagnosis useful, as in the diagnosis of fractures, dislocations, and foreign bodies; the physicians have gradually been able to